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10/593,795	09/21/2006	Witold Gajewski	703491 US	2794

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MAGNA INTERNATIONAL, INC.
337 MAGNA DRIVE
AURORA, ON L4G-7K1
CANADA

EXAMINER

LIU, HENRY Y

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3657

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,795	Applicant(s) GAJEWSKI ET AL.	
	Examiner HENRY LIU	Art Unit 3657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Rejection to Amended Claims

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by MCINTYRE (510,283).

Regarding Claim 1, MCINTYRE teaches “a pulley (10) (Fig. 4) comprising: a hub (5a) configured to be mountable on a driving shaft (1), a rim (outer circumferential surface of (1) (5a) or (4) (6)) with an outer circumferential surface (6) or (4) that defines at least one V-groove (6) (4) and (1) (5a) (Fig. 4) (Col. 2 line 78 – Col. 3 line 15).” The

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outer circumferential surface of (5a) and (1) corresponds to the rim when the cone like structure made up of parts (5) and (6) are moved outward away from the cone formed by part (4) such that the belt (13) contacts the outer circumferential surfaces of (5a) and (1) and lies in between parts (6) and (4). A V-groove is formed when the pulley (Fig. 4) is in this orientation. The surfaces of parts (6) and (4) form the rim when the cone like structures are pushed together such that the belt (13) contacts those surfaces (Fig. 1).

MCINTYRE teaches "a driving connection (2) (5a) between the hub (5a) and rim (outer circumferential surface of (5a) (1)), enabling said hub (5a) and rim to rotate in unison, and a drive assembly (14) (15) (16) (17) extending from the hub (5a)."

MCINTYRE teaches "and operable to configure the rim between a circular profile and a non-circular profile (Fig. 4) (Col. 2 line 78 – Col. 3 line 15)." The outer circumferential surface of (5a) and (1) corresponds to the rim when the cone like structure made up of parts (5) and (6) are moved outward away from the cone formed by part (4) such that the belt (13) contacts the outer circumferential surfaces of (5a) and (1) and lies in between parts (6) and (4). The rim is in a circular profile in this orientation. When parts (6) and (4) are pushed together such that the belt (13) contacts the surfaces of parts (6) and (4) (Fig. 1), the rim has a non circular polygon profile.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over KUGELMANN (5,492,390) in view of GRAY (2,176,335).

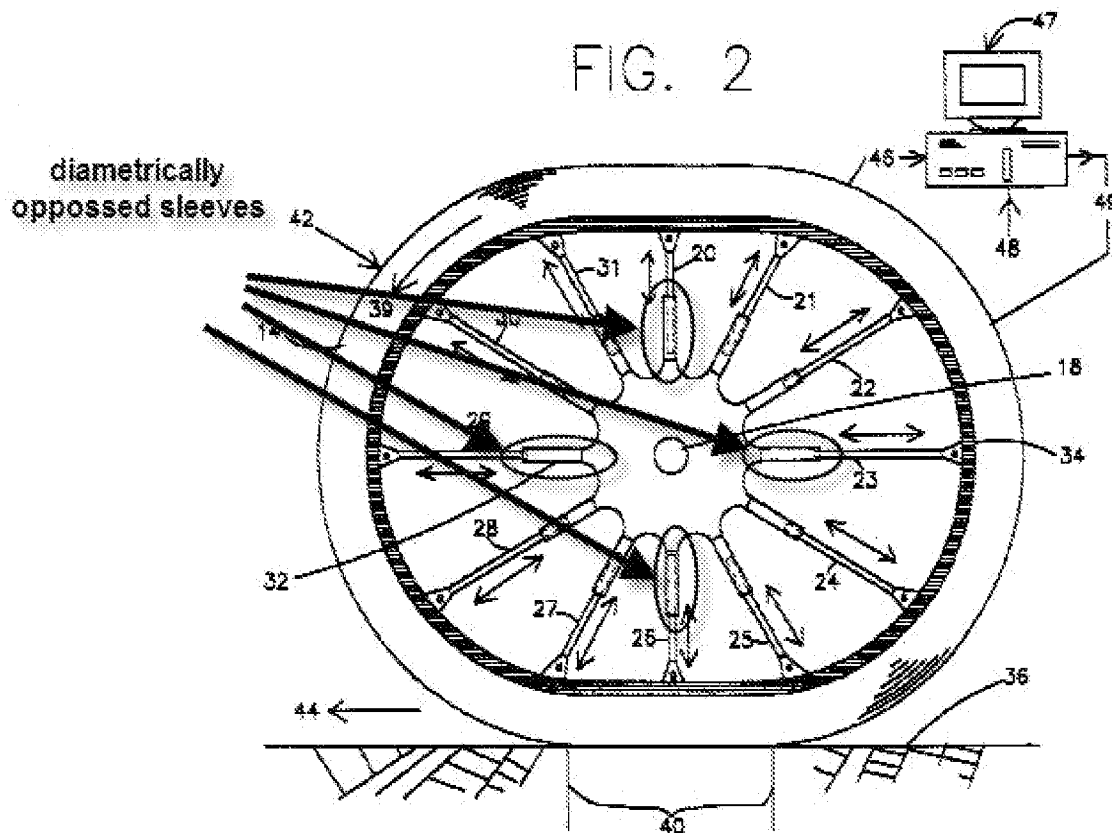
Regarding Claim 1, KUGELMANN teaches "a pulley (10) (Fig. 9, Fig. 10) comprising: a hub (12) configured to be mountable on a driving shaft (18), a rim (34), a driving connection (20) - (31) between the hub (12) and rim (34), enabling said hub (12) and rim (34) to rotate in unison, and a drive assembly extending from the hub (20) – (31)." KUGELMANN teaches "and operable to configure the rim between a circular profile and a non-circular profile (Fig. 1, Fig. 2, Col 3 line 44 – Col. 4 line 68)."

KUGELMAN does not teach "rim with an outer circumferential surface that defines at least one V-groove."

GRAY teaches a pulley with a V-groove (Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pulley in KUGELMANN with the v-groove in GRAY to allow the pulley to drive v-belts.

Regarding Claim 2, KUGELMANN as modified teaches “wherein said driving connection comprises at least two pairs of spaced diametrically opposed sleeves and said drive assembly comprises an actuator mounted within each of said pair of sleeves (Col. 3 lines 45-68).” See figure below. Extension of the ram rods is accomplished through hydraulic, electrical, mechanical, pneumatic means or combinations thereof.



Regarding Claim 3, KUGELMANN as modified teaches “wherein said driving connection comprises two spaced diametrically opposed sleeves arranged along a major axis and along a minor axis and said actuators are arranged to extend along the

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major axis and contract along the minor axis, presenting an oval non-circular profile.”

See figure above. The major axis is the axis coinciding with ram rods (23) and (29).

The minor axis is the axis coinciding with ram rods (20) and (26).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over KUGELMANN (5,492,390) in view of GRAY (2,176,335) and further in view of NAGAI (5,499,547).

Regarding Claim 4, KUGELMANN does not teach “wherein said hub has at least one pair of brushes electrically connected to said actuators, said brushes positioned to engage with a pair of voltage rails transferring electrical energy to energize said actuators.”

NAGAI teaches a linear electric actuator using brushes attached to electrical contacts (56) to transfer electricity to the actuator.

It would have been obvious to one of ordinary skill in the art to modify the pulley in KUGELMANN with the linear actuator in NAGAI to change the shape of the pulley since electricity is an inexpensive and readily available power source.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over KUGELMANN (5,492,390) in view of GRAY (2,176,335) and NAGAI (5,499,547) and further in view of YAEGER (4,559,512).

Regarding Claim 5, KUGELMANN as modified does not teach “wherein said actuator is a shape memory alloy actuator.”

YAEGER teaches a linear actuator using a shape memory alloy (Abstract).

It would have been obvious to one of ordinary skill in the art to modify the pulley in KUGELMANN as modified to include a second linear actuator as in YAEGER to change the shape of the pulley quietly when desired.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over KUGELMANN (5,492,390) in view of GRAY (2,176,335), NAGAI (5,499,547) and YAEGER (4,559,512) and further in view of MITCHELL (3,977,728).

Regarding Claim 6, KUGELMANN does not teach “wherein said rim (34) is molded from an organic resin material.”

MITCHELL teaches a rim made from an organic resin material (Col. 4 lines (46-55)).

It would have been obvious to one of ordinary skill in the art to make the rim in KUGELMANN out of the organic resin in MITCHELL to create a lightweight pulley.

Also, it is obvious to make the rim out of an organic resin, since it has been held to be within the general skill of a worker in the art to select a known material on the

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basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over MCINTYRE (510,283) in view of CRAWLY (4,958,100).

Regarding Claim 7, MCINTYRE teaches an rim (outer circumferential surface of (1) (5a) has at least a pair of diametrically opposed openings (2) in said outer circumferential surface and drive assembly is a pair of stacks (6) operable to extend through said openings presenting said non-circular profile.

MCINTYRE does not teach the use of piezoelectric stacks.

CRAWLY teaches the use of piezoelectric stacks (Col. 6 lines 1-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use piezoelectric stacks to actuate the stacks to slide in and out of the opening.

Also, it is obvious to make the stacks out of a piezoelectric material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over MCINTYRE (510,283) in view of LUENBERGER (3,995,505)

Regarding Claim 8, MCINTYRE teaches an rim (outer circumferential surface of (1) (5a) has at least a pair of diametrically opposed openings (2) in said outer circumferential surface and drive assembly is a pair of elements (6) operable to extend through said openings presenting said non-circular profile.

MCINTYRE does not teach the use of inertia elements.

LUENBERGER teaches the use of an inertially controlled sheave (Fig. 1 - Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission in MCINTYRE with the inertially controlled sheave in LUENBERGER to create a transmission which changes drive ratio depending on rotational speed.

Regarding Claim 9, MCINTYRE as modified teaches all the elements of Claim 9 except “wherein said inertial elements are pivotally mounted on said pulley and each inertia element has a spring biasing said inertia element (MCINTYRE (6)) to an extended position, configuring said rim in said non-circular profile, said biasing element having a mass positioned relative to said spring and pivot enabling said inertia element to move from said extended position to a retracted position as said pulley increases in rotational speed.”

LUENBERGER “wherein said inertial elements are pivotally mounted (51) on said pulley and each inertia element has a spring (41) biasing said inertia element (23) to an extended position, configuring said rim in said non-circular profile, said biasing element having a mass (43) positioned relative to said spring and pivot (51) enabling said inertia element to move from said extended position to a retracted position as said pulley increases in rotational speed (Col. 3 lines 28-69).” Adding the inertial device in LUENBERGER to the pulley in MCINTYRE as modified pushes the inertial element (MCINTYRE (6)) away from the other cone shaped part (MCINTYRE (4)) as the pulley increases in rotational speed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission in MCINTYRE with the inertially controlled sheave in LUENBERGER to create a transmission which changes drive ratio depending on rotational speed.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over MCINTYRE (510,283) in view of OPPER (2,916,927).

Regarding Claim 10, MCINTYRE does not teach “wherein said drive assembly is a hydraulic cylinder communicating with a source of oil pressure, the hydraulic cylinder including a piston that reciprocates along an axis that is parallel to a rotational axis of the pulley.

OPPER teaches a drive assembly using a source of oil pressure and hydraulic cylinder (27) including a piston (29) that reciprocates along an axis that is parallel to a rotational axis of the pulley (Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the drive assembly in MCINTYRE with the hydraulic drive assembly in OPPER to create a reliable and precise drive assembly.

Regarding Claim 11, MCINTYRE does not teach “wherein said rim has a generally non-circular profile, said pulley further comprises a spreader operably engaging between said hydraulic cylinder and said rim, said hydraulic cylinder urging said spreader to engage said rim urging said rim towards said circular profile as said oil pressure increases.”

OPPER teaches a spreader (21). When the spreader urges pulley half (16) away from the pulley half (15) it increases oil pressure in chamber (31). When adding this system to MCINTYRE, it would urge the pulley parts (MCINTYRE (6) (4)) away from each other causing the rim (outer circumferential surface of (1) (5a)) to go into its circular shape.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the drive assembly in MCINTYRE with the hydraulic drive assembly in OPPER to create a reliable and precise drive assembly.

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Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over MCINTYRE (510,283) in view of OPPER (2,916,927) and further in view of CORDS (3,813,883).

Regarding Claim 12, MCINTYRE as modified does not teach “wherein said hydraulic cylinder includes a spring restricting movement of said hydraulic cylinder until said oil pressure reaches a predetermined value.

CORDS teaches hydraulic actuator with a spring which restricts movement of the cylinder until said oil pressure reaches a predetermined value (Col. 1 line 53 - Col. 2 line 19).

It would have been obvious to one of ordinary skill in the art to modify the pulley in MCINTYRE as modified with the hydraulic actuator in CORDS so that the actuators are more easily controlled.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over MCINTYRE (510,283) in view of OPPER (2,916,927)) and further in view of THOMEY (5,722,909).

Regarding Claim 13, MCINTYRE as modified does not teach wherein said source of oil pressure is an engine on which said pulley is mounted.

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THOMEY teaches the use of pulleys connected to an engine and thus next to an oil pressure source.

It would have been obvious to one of ordinary skill in the art to use the pulley in MCINTYRE as modified with the belt drive in THOMEY such that the oil pressure is obtained from the engine, to allow pressure to be added to the system to increase belt pressure as desired.

Regarding Claim 14, MCINTYRE as modified as modified does not teach “wherein said predetermined value is referenced when said engine operates at about 750 RPM.”

It would have been obvious to one of ordinary skill in the art at the time the invention was made to set a predetermined pressure value to occur at 750 RPM, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over BALINGIT (5,520,583) in view of in view of GRAY (2,176,335).

Regarding Claim 1, BALINGIT teaches “a pulley (Fig. 1) comprising: a hub (6) configured to be mountable on a driving shaft (11), a rim (3), a driving connection (2) (4) (8) between the hub (6) and rim (3), enabling said hub (6) and rim (3) to rotate in

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unison, a drive assembly (2) (4) (8) extending from the hub (6).” The combination of parts (2), (4), and (8) correspond to a “drive assembly.” BALINGIT teaches “and operable to configure the rim between a circular profile and a non-circular profile (Fig. 1).” The rim approaches a circular shape as each segment (1) moves towards the bottom of grooves located towards the inside of the rim (7). The rim approaches a non-circular shape as each segment moves to the top of the grooves located towards the outside of the rim (1).

BALINGIT does not teach a pulley with a V-groove.

GRAY teaches a pulley with a V-groove (Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pulley in KUGELMANN with the v-groove in GRAY to allow the pulley to drive v-belts.

Claims 17, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over THOMEY (5,722,909) in view of KUGELMANN (5,492,390).

Regarding Claim 17, THOMEY teaches a method for operating an engine having an endless drive system (10) and a crankshaft pulley , the method comprising: providing an engine (Col. 1 lines 17-33)

THOMEY does not teach “with a crankshaft pulley coupled for rotation with a crankshaft, the crankshaft having a configurable profile; altering the profile of the crankshaft pulley between a circular and a noncircular profile to generate a periodically occurring counteracting torque in the endless drive in response to engine speed.”

KUGELMANN teaches a pulley having a configurable profile between a circular and noncircular profile (Fig. 2) and generates a counteracting torque in response to engine speed (Col. 4 lines 17-67). As the pulley changes shape through rotation, it exerts a counteracting torque on the drive system by bending the belt in an either a smaller or larger radius (Fig. 9, Fig. 10). The profile of the crankshaft pulley is altered in response to a rotational speed of the crankshaft since the faster the pulley turns, the faster the profile changes in order to maintain the same drive ratio and belt tension. The claim language “periodically occurring counteracting torque” is vague enough to encompass the situation where intervals between the counteracting torque are irregular. Thus, the case where the pulleys would change ratios, and thus impart a counteracting torque in the process, whenever the user decides to input a particular drive ratio would meet this claim limitation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the endless drive system in THOMEY with the pulley in KUGELMANN to create an endless drive system in which the belts are easily changed.

Regarding Claim 18, THOMEY as modified teaches “sensing predetermined engine conditions; determining from said engine conditions whether torque loads in the

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endless drive are in excess or about to be in excess of a predetermined value; (THOMEY Col. 1 lines 18-45). The decoupler senses sharp momentary accelerations of the crankshaft and cushions them from the belt drive. Sharp momentary accelerations result in excess torque loads in the endless drive.

THOMEY as modified does not teach "and responsively altering the profile of the crankshaft pulley."

KUGELMANN teaches altering the profile of a pulley according to all relevant data given pulley rim engagement conditions (soil conditions) and rotational speed conditions (Col. 4 lines 17-68).

It would have been obvious to one ordinary skill in the art to modify the method in THOMEY as modified such that the pulley changes profile to cushion sharp momentary accelerations in the crankshaft.

Regarding Claim 19, THOMEY as modified teaches "wherein said predetermined engine characteristics include engine speed and tension in the endless drive." The decoupler senses sharp momentary accelerations of the crankshaft and cushions them from the belt drive. Sharp momentary accelerations result in excess torque loads in the endless drive (THOMEY Col. 1 lines 18-45). The pulley alters its profile according to all relevant data given pulley rim engagement conditions (soil conditions) and rotational speed conditions (KUGELMANN Col. 4 lines 17-68).

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Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over KUGELMANN (5,492,390) in view of GRAY (2,176,335) and further in view of TURNER (3,438,360).

Regarding Claim 15, KUGELMANN teaches " A pulley comprising (10): a hub (12) configured to be mountable on a driving shaft (18), and a rim (34) drivingly connected to the hub (12), said rim (34) having a non-circular profile (Fig. 2)."

KUGELMANN does not teach "and said hub (12) having means for orienting said hub in a predetermined position relative to said driving shaft."

TURNER teaches timing marks on sprockets (Col. 2 lines 1-44)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pulley in KUGELMANN with the keyway connection in TURNER to allow the pulley to maintain an oval shape where the major and minor axis stay at a predetermined location relative to a stationary reference point while the pulley is turning.

Regarding Claim 16, KUGELMANN as modified teaches "wherein said non-circular profile has a major axis and said predetermined position has the major axis between 90° to 120° from a reference direction, being a direction of the angle of wrap bisection, taken in the direction of rotation of the pulley (Fig. 2)."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENRY LIU whose telephone number is (571) 270-7018. The examiner can normally be reached on Mon-Thurs 7:30am - 5:00pm ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ROBERT SICONOLFI can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HENRY LIU/
Examiner, Art Unit 3657

/Robert A. Siconolfi/
Supervisory Patent Examiner, Art
Unit 3657